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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Steven Lefkowitz

Serial No.: 09/944,083 Examiner: My Chau T Tran

Filing Date: August 31, 2001 Group Art Unit: 1639

Title: METHODS FOR GENERATING LIGAND ARRAYS VIA DEPOSITION OF LIGANDS ONTO OLEFIN DISPLAYING SUBSTRATES, AND ARRAYS PRODUCED THEREBY

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria VA 22313-1450

TRANSMITTAL OF REPLY BRIEF

Sir:

Transmitted herewith is the Reply Brief with respect to the Examiner's Answer mailed on 04-05-2006 This Reply Brief is being filed pursuant to 37 CFR 1.193(b) within two months of the date of the Examiner's Answer.

(Note: Extensions of time are not allowed under 37 CFR 1.136(a))

(Note: Failure to file a Reply Brief will result in dismissal of the Appeal as to the claims made subject to an expressly stated new grounds of rejection.)

No fee is required for filing of this Reply Brief.

If any fees are required please charge Deposit Account 50-1078.

Respectfully submitted,

Steven Lefkowitz

By

Bret E. Field for Herbert Schulze
Attorney/Agent for Applicant(s)

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Date: 05-15-2006

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REPLY BRIEF Address to: Box DAC Assistant Commissioner for Patents Alexandria, VA 22313-1450		
	Attorney Docket	10010381-1
	First Named Inventor	Steven Lefkowitz
	Application Number	09/944,083
	Filing Date	August 31, 2001
	Group Art Unit	1639
	Examiner Name	My Chau T Tran
	Title: *Methods for Generating Ligand Arrays Via Deposition of Ligands onto Olefin Displaying Substrates, and Arrays Produced Thereby*	

Sir:

This Reply Brief is in response to the Examiner's Answer mailed by the Office on April 5, 2006.

Please charge any required fees to Deposit Account No. 50-1078, order number 10010381-1.

REPLY BRIEF

In this Reply Brief, the Appellants address comments made in the Supplemental Examiner's Answer mailed April 5, 2006. The Supplemental Examiner's Answer is identical to the Examiner's Answer mailed October 19, 2005, apart from Section (8) in which the four patents cited in the rejections are listed as evidence relied upon. The Examiner has raised no new grounds for rejection. The Appellants note that all arguments presented in the prior Appeal Brief still apply with equal force, but are not reiterated in full herein solely in the interest of brevity and for the convenience of the Board.

The comments of the Appellants with regard to the Examiner's assertions in the Examiner's Answer are provided below, with a separate header for each maintained ground of rejection (as in the Appeal Brief).

I. Claims 7-26 and 44-51 are not obvious under 35 U.S.C. § 103(a) over Wang et al. (US Patent 5,922,617) in view of Bensimon et al. (US Patent 5,846,724).

In the Appeal Brief, the Appellants argued that neither Wang et al. nor Bensimon et al. teach or suggest step (b) of the claimed invention, namely converting olefin functional groups (displayed on the surface of a substrate) to ligand reactive functional groups that produce covalent bonds with polymer ligands upon contact.

In the Response to Argument section of the Reply Brief, the Examiner relies on the same citations cited in the Final Rejection in Bensimon et al. to assert that the combined teachings of Wang et al. and Bensimon et al. teach step (b) of the claimed invention. In addition, the Examiner again asserts that the claimed invention does not require that the olefin functional group be converted to a distinct ligand reactive functional group.

The citations relied upon by the Examiner for teaching the conversion step of the claimed invention are reproduced below:

> They [surface groups with double bond, or C=C] are capable of directly anchoring molecules of biological interest (DNA, RNA, PNA, proteins, lipids, saccharides) under certain conditions of pH or ionic content of the medium. (*col. 3 lines43-46*)

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> Within the framework of the present invention, it has been demonstrated that these surfaces have a reactivity which is highly pH-dependent. This characteristic makes it possible to anchor the nucleic acids or the proteins, especially by their end(s), using a determined pH region and often with a reaction rate which can be controlled by the pH. (*col. 6 lines 50-56*)

The Examiner is equating the pH dependency of the anchoring reaction between the ligand and the ligand-reactive olefin functional group with the conversion step (b) of the claimed invention. As is evident from the passages cited above, Bensimon et al. fail to teach or even suggest that the olefin functional group is converted to a ligand reactive functional group. Bensimon et al. are merely disclosing that the reactivity of a ligand with an olefin functional group is pH dependent.

Furthermore, the Appellants again submit that Bensimon et al. specifically exclude a converting step as is claimed in the subject application. For support of this position, the Appellants point to col. 3 lines 40-50 of Bensimon et al. which states:

> These highly specific surfaces for biological reactions, contain a support having at the surface groups with a double bond, especially vinyl (-CH=CH2, hereinajler C=C surfaces) which are accessible to the solution. They are capable of **directly anchoring molecules of biological interest** (DNA, RNA, PNA, proteins, lipids, saccharides) under certain conditions of pH or ionic content of the medium. In particular, **these surfaces do not require specific chemical modifcation either of the surface or of the biological molecules to be anchored**. There are no documents mentioning such a use of a surface with vinyl groups. (*emphasis added*)

Therefore, the Appellants submit that Bensimon et al. have failed to disclose conversion of olefin functional groups to distinct ligand-reactive functional groups as is claimed, and in fact teach away from this step of the claimed invention. Indeed, Bensimon et al. state explicitly that the surfaces (i.e., olefin functional groups) do not require specific chemical modification to anchor the biological molecules of interest (see second bold section cited above).

As stated above, the Examiner continues to assert that the claimed invention does not require that olefin functional groups be converted to distinct ligand reactive functional groups. However, as described in detail in the Appeal Brief, the

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Appellants respectfully disagree. The Appellants again point to page 10, line 33 to page 11, line 13 which describe what is meant by "converting":

> By ligand reactive functional groups is meant groups that react with moieties present on the target ligands, (i.e., the ligands to be deposited onto the surface and covalently bound thereto) in manner that produces a covalent bond or linkage between the ligand and the substrate surface. **The olefinic functional groups may be converted to a variety of different types of reactive moieties using a variety of different protocols, depending on the particular nature of the ligand that is to be covalently bound to the substrate surface.** Representative ligand reactive functional groups to which the initial olefinic functional groups may be converted include: **alcohols, aldehyes, activated carboxylates, amines, imidazolyl carbamates, mercaptans, anhydrides, and the like**. The particular ligand reactive functional group to which the initial olefinic group is converted will be chosen, at least in part, on considerations that include, but are not limited to: the nature of the ligand and functional groups that may be present thereon, ease of conversion, and the like. (*emphasis added*)

As can be seen from this passage, the Appellants have defined the converting of olefin functional groups as resulting in the production of "*different types of reactive moieties*". This passage goes on recite types of different moieties of interest, including "*alcohols, aldehyes, activated carboxylates, amines, imidazolyl carbamates, mercaptans, anhydrides, and the like*".

Furthermore, the Appellants submit that because the cited references fail to teach or suggest converting the olefin functional group at all (*Claim Group I*), they also fail to teach or suggest converting the olefin functional group to: an aldehyde or a benzaldehyde (*Claim Group II*); an activated carboxylate ester (*Claim Group III*); an amine (*Claim Group IV*); or an imidazolyl carbamate (*Claim Group V*). As such, these claims are further distinguished over the teachings of Wang et al. and Bensimon et al.

In summary, the Appellants reiterate that step (b) of the claimed invention requires that the olefin functional groups be converted to distinct ligand reactive moieties and that neither Bensimon et al. nor Wang et al. teach this element. Figure 1 of the Appeal Brief illustrates the differences between the claimed invention and the teachings of Bensimon et al. (reproduced below).

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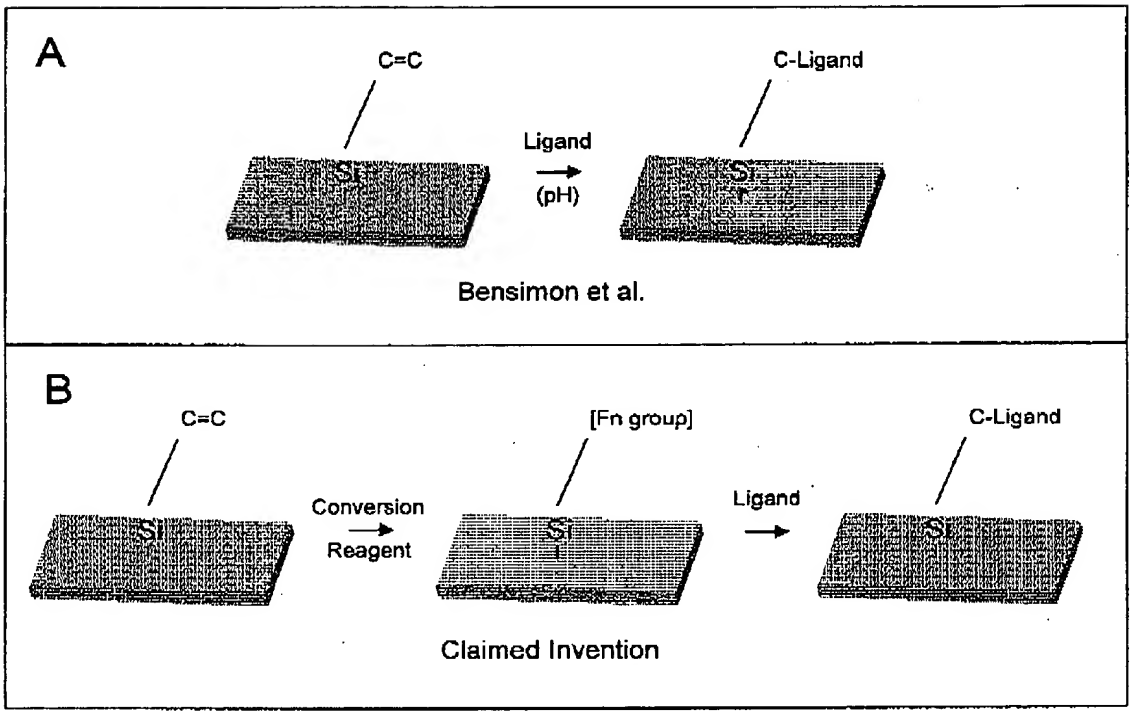

Figure 1. Comparison of teachings of (A) Bensimon et al. with (B) the claimed invention. As argued in the Appeal Brief and restated above, none of the cited references teach or suggest the step of converting the olefin functional group (C=C) to a distinct ligand reactive functional group [Fn group] prior to contacting the substrate with the ligand.

In view of the deficiencies in the cited references in establishing a *prima facie* case of obviousness for the claimed invention, the Appellants respectfully request reversal of this rejection.

II. Claims 7-26 and 44-51 are not obvious under 35 U.S.C. § 103(a) over Pirrung et al. (US Patent 5,143,854) in view of Bensimon et al. (US Patent 5,846,724).

In the Appeal Brief, the Appellants argued that neither Pirrung et al. nor Bensimon et al. teach or suggest step (b) of the claimed invention, namely converting olefin functional groups (displayed on the surface of a substrate) to ligand reactive functional groups that produce covalent bonds with polymer ligands upon contact.

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In the Response to Argument section of the Reply Brief, the Examiner again asserts that Bensimon et al. teach step (b) of the claimed invention. In addition, the Examiner asserts that the claimed invention does not require that the olefin functional groups be converted to distinct ligand reactive functional groups.

The rationale used by the Examiner in making these assertions is identical to the rationale employed in the rejection above.

Therefore, for the reasons detailed above (and in the Appeal Brief), the Appellants submit that step (b) of the claimed invention is neither taught nor suggested by the combination of the cited references. Specifically, the Appellants submit that the claimed invention specifies that the olefin functional groups be converted to distinct ligand reactive moieties and that neither Bensimon et al. nor Pirrung et al. teach this element.

Furthermore, the Appellants submit that because the cited references fail to teach or suggest converting the olefin functional group at all (*Claim Group I*), they also fail to teach or suggest converting the olefin functional group to: an aldehyde or a benzaldehyde (*Claim Group II*); an activated carboxylate ester (*Claim Group III*); an amine (*Claim Group IV*); or an imidazolyl carbamate (*Claim Group V*). As such, these claims are further distinguished over the teachings of Pirrung et al. and Bensimon et al.

In view of the deficiencies in the cited references in establishing a *prima facie* case of obviousness for the claimed invention, the Appellants respectfully request reversal of this rejection.

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SUMMARY

The Appellants respectfully request that the rejection of claims 7-26 and 44-51 under 35 U.S.C. § 103(a) be reversed, and that the application be remanded to the Examiner with instructions to issue a Notice of Allowance.

Respectfully submitted,
BOZICEVIC, FIELD & FRANCIS LLP

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